Diagnostics Competition Results

1 UNIVERSITY OF CALIFORNIA, DAVIS — Neville Luhmann

Innovative Diagnostic Developments for Turbulence and Transport Measurement and Visualization

Renewal: 2-D ECE imaging for Te and Te~, 2-D microwave imaging reflectometry for ne~; ITG modes, transport, core imaging

TEXTOR

2 PRINCETON PLASMA PHYSICS LABORATORY — Ernesto Mazzucato

Innovative Diagnostic Developments for Turbulence and Transport Measurement and Visualization

Renewal: Collaborative effort with above UC Davis proposal

3 UNIVERSITY OF CALIFORNIA, LOS ANGELES — Dave Brower

Development of Advanced Magnetic and Density Diagnostics for Fusion Science

Renewal: High-resolution (amplitude & time) polarimetry/interferometry for internal B field structure, B~, ne, and ne~; RFP transport

MST, HSX

4 UNIVERSITY OF CALIFORNIA, LOS ANGELES — Tony Peebles

A Unique Measurement System to Investigate the Existence and Role of Predicted Turbulent Modes in Electron and Ion Transport

Renewal, New Direction: Collective high-k FIR scattering for ne~, spatially localized; ETG. Reflectometry for low-k ne~ and FIR polarimetry for B~; ITG, tearing modes. Dual mode reflectometry for local B mod;q profile,stability in ST. Mode conversion scatt. for B~ @ hi-k; ETG

DIII-D, ET

5 GENERAL ATOMICS — Ray Fisher

Alpha Particle Diagnostics and Physics Studies

Renewal: Bubble neutron detectors for DT neutron tails due to alpha particle-plasma ion collisions; spatial and energy distribution of confined DT alphas in hot plasma core

JET

Diagnostics Competition Results

6 JOHNS HOPKINS UNIVERSITY — Warren Moos; Mike Finkenthal

USXR to XUV Diagnostics for Edge and Core Tokamak and Alternative Concept MCF Plasmas

Renewal, Some New Directions: Fast, large-pixel imaging USXR-XUV spectroscopy for line and continuum emission; particle transport, MHD, turbulence, Zeff, and local power loss

NSTX

7 LAWRENCE LIVERMORE NATIONAL LABORATORY — Mark May; Peter Beiersdorfer

Toroidal Rotation Measurements for Tokamaks with Fast Time Resolution

New: Visible spectroscopy for highly charged ions; plasma toroidal rotations (200 usec to 1 msec), L-H mode transitions

C-Mod

8 UNIVERSITY OF MARYLAND — Hans Griem

Measurement of Radiative Transfer in Vacuum-UV Emission from Magnetic Fusion Devices

Renewal, New Direction: High-resolution transmission grating VUV spectrometer for deuterium Ly alpha transitions; particle transport and turbulence

MCX, C-Mod

9 MASSACHUSETTS INSTITUTE OF TECHNOLOGY — Miklos Porkolab

Phase Contrast Imaging Diagnostic

Renewal: Phase contrast imaging (interferometry) for ne~; high-k ETG modes, low-k ITG

DIII-D, C-Mod

10 MASSACHUSETTS INSTITUTE OF TECHNOLOGY — Paul Woskov

High Power Collective Thomson Scattering Diagnostics on Energetic Ions

Renewal: High power CTS for MeV-ion energy distribution, localization, and direction: TAE modes, sawteeth, ITBs

TEXTOR, ASDEX

Diagnostics Competition Results

11 NOVA PHOTONICS, INC. Fred Levinton

Development of the Motional Stark Effect Diagnostic Using Laser-Induced Fluorescence

Renewal: Motional stark effect using laser-induced fluorescence for B field and B field pitch angle; current density and pressure profiles

NSTX

12 PRINCETON PLASMA PHYSICS LABORATORY Manfred Bitter

X-ray Imaging Crystal Spectrometer for Magnetic Fusion Energy Research

New: X-ray imaging spherically bent quartz crystal spectrometer for trace impurities; Ti and Te profiles, impurity ion charge state distribution

NSTX

13 PRINCETON PLASMA PHYSICS LABORATORY Phil Efthimion

Completion of a New ECE Diagnostic for Measurement of Temperature Based Upon the Electron Bernstein Wave

Renewal: Microwave radiometer for EBW emission; Te, EBW current drive and heating

CDX-U, NSTX

14 RENSSELAER POLYTECHNIC INSTITUTE Paul Schoch; Diane Demers

Mapping the Magnetic Field Structure of a Plasma via Spectroscopic Ion Beam Imaging

Renewal, New Direction: Spectral imaging of a heavy ion beam for time resolved internal B field profile; RFP current profile equilibrium reconstruction

MST

15 UNIVERSITY OF WISCONSIN Ray Fonck

Diagnosis of Multifield, Multidimensional, Nonlinear Turbulence Properties in Advanced Tokamak Plasmas

Renewal: 2D BES for n~, vr~, vtheta~ from density field analysis; nonlinear mode coupling, E transfer and growth rates, and zonal flow. High-freq CHERS for Ti~, vphi~; core turbulent particle and heat fluxes

DIII-D